

ABSTRACT OF THE INVENTION

There is provided a method of applying a surface treatment, such as coating, denaturation, modification and etching, to a surface of a substrate. The method comprises the steps of bringing a surface treatment gas into contact with a surface of a substrate, and irradiating the surface of the substrate with a fast particle beam to enhance an activity of the surface and/or the surface treatment gas thereby facilitating the reaction between the surface and the gas. The fast particle beam may be selected from a group consisting of an electron beam, a charged particle beam, an atomic beam and molecular beam. For example, in a coating operation, chemically deposition of predetermined component elements of the gas onto the surface is effected and a predetermined portion in the surface of the substrate is irradiated with a particle beam to form a coating layer on the predetermined portion.